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EXAMINER	
DANIEL JR, WILLIE J	

ART UNIT	PAPER NUMBER
2617	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	09/998,489	HAYEK ET AL.	
	Examiner	Art Unit	
	Willie J. Daniel, Jr.	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16-22 and 24-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-10* is/are allowed.

6)☒ Claim(s) *11,13,16-22 and 24-27* is/are rejected.

7)☒ Claim(s) *12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to applicant's amendment filed on 08 November 2007. **Claims 1-14, 16-22, and 24-27** are now pending in the present application and **claims 15 and 23** are canceled. This office action is made **Final**.

Claim Objections

2. The objections applied to the claims are withdrawn, as the proposed claim corrections are approved.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. **Claim 26** recites the limitation "...the frequency divide ratio q equals the harmonic number n..." in line(s) 11 of the claim.

Regarding **claim 26**, the claim recites language that is not clear and concise in which the Examiner respectfully request the applicant to clarify the claim. If the applicant considers the current language to be sufficient, the Examiner respectfully requests page(s), line(s), and/or drawing(s) of the instant application that supports the claim language and any supportive comment(s) to help clarify and resolve this issue(s).

In response to applicant's remark on pg. 11, 1st par., "...specification on pg. 13, lines 21-24...", the Examiner requests clarification. The current specification has nine (9) pages and no page is numbered 13.

4. Due to the *unclear* language of the claim, the Examiner has given a reasonable interpretation of said language and the claims are rejected as broadest and best interpreted

5. This list of examples is not intended to be exhaustive. The Examiner respectfully requests the applicant to review all claims and clarify the issues as listed above as well as any other issue(s) that are not listed.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11, 18, 24, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (US 6,731,923 B2)** in view of **Mouly et al.** (hereinafter Mouly) "The GSM System for Mobile Communications".

Regarding **claims 11, 18,** and **24**, Atkinson discloses a method in intermediate frequency and direct conversion receivers, comprising:

receiving a signal (see col. 3, lines 12-18; Fig. 2);

providing a local oscillator signal (34) which reads on the claimed "mixer injection frequency" by dividing a voltage controlled oscillator (VCO 38) output by a frequency divide

ratio (see col. 3, lines 19-44; Fig. 2), where a frequency (e.g., 1.35 GHz) is different from the received frequency (e.g., 1.8 GHz),

the voltage controlled oscillator (38) having a frequency (e.g., F_3) outside received signal harmonics (see col. 3, lines 46-52; Fig. 2), where the signal is not harmonic;

mixing the received signal at a mixer injection frequency, outside a fundamental frequency of the received signal (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal. Atkinson does not specifically disclose having the feature outside a bandwidth. However, the examiner maintains that the feature outside a bandwidth was well known in the art, as taught by Mouly.

In the same field of endeavor, Mouly discloses the feature outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g., GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson and Mouly to have the feature outside a bandwidth, in order that any coupling of the input RF signal to the VCO should have a minimal effect on the operation of the VCO, as taught by Atkinson (see col. 3, lines 50-52).

Regarding **claim 27**, Atkinson discloses a method in intermediate frequency and direct conversion receivers, comprising:

receiving a signal (see col. 3, lines 12-18; Fig. 2);

providing a local oscillator signal (34) which reads on the claimed "mixer injection frequency" by dividing a voltage controlled oscillator (VCO 38) output by a frequency divide ratio (see col. 3, lines 19-44; Fig. 2), where a frequency (e.g., 1.35 GHz) is different from the received frequency (e.g., 1.8 GHz),

the voltage controlled oscillator (38) having a frequency (e.g., F_3) outside received signal harmonics (see col. 3, lines 46-52; Fig. 2), where the signal is not harmonic;

determining a condition of the received signal (see col. 4, lines 4-10), where the system determines a condition of interference;

mixing the received signal at a mixer injection frequency derived from a voltage controlled oscillator frequency that is outside the harmonics of the received signal only if the condition of the received signal is above a threshold (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal. Atkinson does not specifically disclose having the feature outside a bandwidth. However, the examiner maintains that the feature outside a bandwidth was well known in the art, as taught by Mouly.

Mouly further discloses the feature outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g., GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson and Mouly to have the feature

outside a bandwidth, in order that any coupling of the input RF signal to the VCO should have a minimal effect on the operation of the VCO, as taught by Atkinson (see col. 3, lines 50-52).

Claims 13-14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (US 6,731,923 B2)** in view of **Mouly et al.** (hereinafter Mouly) "The GSM System for Mobile Communications" as applied to claim 11 above, and further in view of **Atkinson et al.** (hereinafter Atkinson '518) (**US 6,731,923 B2**).

Regarding **claim 13**, the combination of Atkinson and Mouly discloses every limitation claimed, as applied above, (see claim 11), in addition Atkinson further discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of a received signal (e.g., outside the channel bandwidth of 200 kHz) (see col. 3, lines 34-52; col. 4, lines 37-65), where the system can operate at 1800 MHz with a channel bandwidth of 200 kHz that in not harmonic. As a note, Atkinson discloses selecting a frequency divide ratio equal to one that would accommodate the system by maintaining local oscillator frequency outside the bandwidth of harmonics or a fundamental frequency of the received signal in order to prevent leakage of the local oscillator frequency. The combination of Atkinson and Mouly does not specifically disclose having the feature dividing the voltage controlled output by a frequency divide ratio equal to one. However, the examiner maintains that the feature dividing the voltage controlled output by a frequency divide ratio equal to one was well known in the art, as taught by Atkinson '518.

In the same field of endeavor, Atkinson '518 discloses the feature dividing the voltage controlled output by a frequency divide ratio equal to one (see col. 6, lines 30-33; col. 5, lines 51-58), where the values of m and n can be selected to achieve the needed result in which equal to one would be inherent to provide the appropriate ratio.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Atkinson '518 to have the feature dividing the voltage controlled output by a frequency divide ratio equal to one, in order to provide a direct conversion receiver or transmitter that has reduced leakage or interference between the radio frequency input signal and the local oscillator, as taught by Atkinson '518 (see col. 2, lines 63-67).

Regarding **claim 26**, Atkinson discloses a method in intermediate frequency and direct conversion receivers, comprising:

receiving a signal (see col. 3, lines 12-18; Fig. 2);

providing a local oscillator signal (34) which reads on the claimed "mixer injection frequency" by dividing a voltage controlled oscillator (VCO 38) output by a frequency divide ratio (see col. 3, lines 19-44; Fig. 2), where a frequency (e.g., 1.35 GHz) is different from the received frequency (e.g., 1.8 GHz),

the voltage controlled oscillator (38) having a frequency (e.g., F_3) outside received signal harmonics (see col. 3, lines 46-52; Fig. 2), where the signal is not harmonic;

mixing the received signal at a mixer injection frequency derived from a VCO frequency that is outside the n^{th} harmonic of the received signal (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile

communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal,

the frequency divide ratio q equals the harmonic number n (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system output signal is not harmonic. Atkinson does not specifically disclose having the feature outside a bandwidth. However, the examiner maintains that the feature outside a bandwidth was well known in the art, as taught by Mouly.

Mouly further discloses the feature outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g., GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson and Mouly to have the feature outside a bandwidth, in order that any coupling of the input RF signal to the VCO should have a minimal effect on the operation of the VCO, as taught by Atkinson (see col. 3, lines 50-52). However, the examiner maintains that the feature the frequency divide ratio q equals the harmonic number n was well known in the art, as taught by Atkinson '518.

Atkinson '518 further discloses the feature the frequency divide ratio q equals the harmonic number n (see col. 3, lines 58-62; col. 6, lines 30-33; col. 5, lines 51-58), where the values of m and n can be selected to achieve the needed result in which equal to one would be inherent to provide the appropriate ratio.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Atkinson '518 to have the feature the frequency divide ratio q equals the harmonic number n, in order to

provide a direct conversion receiver or transmitter that has reduced leakage or interference between the radio frequency input signal and the local oscillator, as taught by Atkinson '518 (see col. 2, lines 63-67).

Regarding **claim 14**, the combination of Atkinson and Mouly discloses every limitation claimed, as applied above, (see claim 26), in addition Atkinson further discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of a received signal (e.g., outside the channel bandwidth of 200 kHz) (see col. 3, lines 34-52; col. 4, lines 37-65), where the system can operate at 1800 MHz with a channel bandwidth of 200 kHz that in not harmonic. As a note, Atkinson discloses selecting a frequency divide ratio equal to one that would accommodate the system by maintaining local oscillator frequency outside the bandwidth of harmonics or a fundamental frequency of the received signal in order to prevent leakage of the local oscillator frequency. The combination of Atkinson and Mouly does not specifically disclose having the feature dividing the voltage controlled output by a frequency divide ratio greater than one. However, the examiner maintains that the feature dividing the voltage controlled output by a frequency divide ratio greater than one was well known in the art, as taught by Atkinson '518.

Atkinson '518 further discloses the feature dividing the voltage controlled output by a frequency divide ratio greater than one (see col. 6, lines 30-33; col. 5, lines 51-58), where the values of m and n can be selected to achieve the needed result in which equal to one would be inherent to provide the appropriate ratio.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Atkinson '518 to have the feature dividing the voltage controlled output by a frequency divide ratio greater than one, in order to provide a direct conversion receiver or transmitter that has reduced leakage or interference between the radio frequency input signal and the local oscillator, as taught by Atkinson '518 (see col. 2, lines 63-67).

Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (US 6,731,923 B2)** in view of **Mouly et al.** (hereinafter Mouly) "The GSM System for Mobile Communications" as applied to claim 27 above, and further in view of **Freed (US 6,487,419 B1)**.

Regarding **claim 16**, the combination of Atkinson and Mouly discloses every limitation claimed as applied above in claim 27. As a note, Atkinson discloses of the system determining a condition of interference (see col. 4, lines 4-10), where a condition such as interference can affect the received signal strength (RSS). The combination of Atkinson and Mouly does not specifically disclose having the feature determining the condition of the received signal by determining a strength thereof. However, the examiner maintains that the feature determining the condition of the received signal by determining a strength thereof was well known in the art, as taught by Freed.

In the same field of endeavor, Freed discloses the feature determining the condition of the received signal by determining a strength thereof (see abstract; col. 2, line 20 - col. 3, line 26; col. 4, line 58 - col. 5, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Freed to have the feature determining the condition of the received signal by determining a strength thereof, in order to improve power management in wireless telephones while still meeting the signal handling requirements of the modes of operation of the wireless telephones, as taught by Freed (see col. 2, lines 1-4).

Regarding **claim 17**, the combination of Atkinson and Mouly discloses every limitation claimed as applied above in claim 27. As a note, Atkinson discloses of the system determining a condition of interference (see col. 4, lines 4-10), where a condition such as interference can effect the received signal strength (RSS). The combination of Atkinson and Mouly does not specifically disclose having the feature determining the condition of the received signal by determining a signal strength and bit error rate (BER) thereof, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold. However, the examiner maintains that the feature determining the condition of the received signal by determining a signal strength and bit error rate (BER) thereof, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold was well known in the art, as taught by Freed.

Freed further discloses the feature determining the condition of the received signal by determining a signal strength and bit error rate (BER) thereof, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold (see abstract; col. 2, line 20 - col. 3, line 26; col. 4, line 58 - col. 5, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson, Mouly, and Freed to have the feature determining the condition of the received signal by determining a signal strength and bit error rate (BER) thereof, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold, in order to improve power management in wireless telephones while still meeting the signal handling requirements of the modes of operation of the wireless telephones, as taught by Freed (see col. 2, lines 1-4).

Claims 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al.** (hereinafter Arpaia) (**US 6,192,225 B1**) in view of well known prior art (**MPEP 2144.03**) which is hereby supported by **Hash** (**US 6,721,369 B1**).

Regarding **claims 19 and 25**, Arpaia discloses a method in an RF receiver (see Fig. 2), comprising:

receiving a signal within a passband of a preselector filter (1) which reads on the claimed "pre-selection filter" of the receiver (see col. 3, lines 20-25; col. 4, lines 1-6; Fig. 2);

mixing the received signal at a mixer injection (e.g., local oscillator) frequency f_0 outside the passband of the pre-selection filter (1) (see col. 4, lines 47-50; col. 4, line 58 - col. 5, line 3; Fig. 2);

chopping the received signal after mixing at the same chopper frequency, the chopper frequency proportional to the mixer injection frequency f_0 (see col. 4, lines 21-57). Arpaia does not specifically disclose the feature chopping the signal before mixing. However, the

examiner takes official notice of the fact that it was well known in the art to have the feature chopping the signal before mixing.

As a note, one of ordinary skill in the art would clearly recognize that the feature chopping the signal before mixing is common knowledge. For example, Arpaia discloses the received signal is not affected by the phase change element (5) and inverters (9, 9' "chop-up").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Arpaia by specifically having the feature chopping the signal before mixing, for the purpose of improving the elimination of second-order products of the received signal (see Arpaia -col. 4, lines 34-50).

Additionally, to address as further support of the Examiner taking official notice of the fact that it was well known in the art to have the feature(s) chopping the signal before mixing. Hash specifically discloses the feature(s) chopping the signal before mixing (see col. 3, line 64 - col. 4, line 24; col. 4, line 39-52; Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Arpaia with Hash by specifically having the feature(s) chopping the signal before mixing, for the purpose of providing an amplitude modulation-binary phase shift keyed based spectral regrowth suppression mechanism, as taught by Hash (see col. 2, line 66 - col. 3, line 7).

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al.** (hereinafter Arpaia) (**US 6,192,225 B1**) in view of well known prior art (**MPEP 2144.03** - which is hereby supported by **Hash** (**US 6,721,369 B1**)) as applied to claim 19 above, and further in view of **Freed** (**US 6,487,419 B1**).

Regarding **claim 20**, the combination of Arpaia and Hash discloses every limitation claimed as applied above in claim 19. The combination of Arpaia and Hash does not specifically disclose having the feature increasing a gain of the received signal before mixing if the received signal gain is below a threshold. However, the examiner maintains that the feature increasing a gain of the received signal before mixing if the received signal gain is below a threshold was well known in the art, as taught by Freed.

In the same field of endeavor, Freed discloses the feature increasing a gain of the received signal before mixing if the received signal gain is below a threshold (see abstract; col. 2, line 20 - col. 3, line 26; col. 4, line 58 - col. 5, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of modified Arpaia, Hash, and Freed to have the feature increasing a gain of the received signal before mixing if the received signal gain is below a threshold, in order to improve power management in wireless telephones while still meeting the signal handling requirements of the modes of operation of the wireless telephones, as taught by Freed (see col. 2, lines 1-4).

Regarding **claim 21**, the combination of Arpaia and Hash discloses every limitation claimed as applied above in claim 19. The combination of Arpaia and Hash does not specifically disclose having the feature determining a gain of the received signal, mixing the

received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the passband of the pre-selection filter if the measured gain is below the threshold. However, the examiner maintains that the feature determining a gain of the received signal, mixing the received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the passband of the pre-selection filter if the measured gain is below the threshold was well known in the art, as taught by Freed.

Freed further discloses the feature determining a gain of the received signal, mixing the received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the passband of the pre-selection filter if the measured gain is below the threshold (see abstract; col. 2, line 20 - col. 3, line 26; col. 4, line 58 - col. 5, line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of modified Arpaia, Hash, and Freed to have the feature determining a gain of the received signal, mixing the received signal at the mixer injection frequency outside the passband of the pre-selection filter when the measured gain is above a threshold, mixing the received signal at a mixer injection frequency within the passband of the pre-selection filter if the measured gain is below the threshold, in order to improve power management in wireless telephones while still meeting the signal handling

requirements of the modes of operation of the wireless telephones, as taught by Freed (see col. 2, lines 1-4).

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al.** (hereinafter Arpaia) (**US 6,192,225 B1**) in view of well known prior art (**MPEP 2144.03** - which is hereby supported by **Hash** (**US 6,721,369 B1**)), and further in view of **Atkinson** (**US 6,731,923 B2**) in view of **Mouly et al.** (hereinafter Mouly) "The GSM System for Mobile Communications".

Regarding **claim 22**, Arpaia discloses a method in intermediate frequency and direct conversion receivers (see Fig. 2). As a note, Arpaia discloses chopping the received signal after mixing at the same chopper frequency, the chopper frequency proportional to the mixer injection frequency f_0 (see col. 4, lines 21-57), where the system receives a signal that is chopped up. Arpaia does not specifically disclose the feature(s) chopping a received signal; mixing the received signal after chopping at a mixer injection frequency; providing a mixer injection frequency derived from a voltage controlled oscillator frequency outside a bandwidth of received signal harmonics by dividing a voltage controlled oscillator output by a frequency divide ratio, a harmonic of the received signal corresponding to the divide ratio of the frequency divider. However, the examiner takes official notice of the fact that it was well known in the art to have the features chopping a received signal; mixing the received signal after chopping at a mixer injection frequency.

As a note, one of ordinary skill in the art would clearly recognize that the features chopping a received signal; mixing the received signal after chopping at a mixer injection

frequency is common knowledge. For example, Arpaia discloses the received signal is not affected by the phase change element (5) and inverters (9, 9' "chop-up").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Arpaia by specifically having the features chopping a received signal; mixing the received signal after chopping at a mixer injection frequency, for the purpose of improving the elimination of second-order products of the received signal (see Arpaia -col. 4, lines 34-50).

Additionally, to address as further support of the Examiner taking official notice of the fact that it was well known in the art to have the feature(s) chopping a received signal; mixing the received signal after chopping at a mixer injection frequency. Hash specifically discloses the feature(s) chopping a received signal; mixing the received signal after chopping at a mixer injection frequency (see col. 3, line 64 - col. 4, line 24; col. 4, line 39-52; Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Arpaia with Hash by specifically having the feature(s) chopping a received signal; mixing the received signal after chopping at a mixer injection frequency, for the purpose of providing an amplitude modulation- binary phase shift keyed based spectral regrowth suppression mechanism, as taught by Hash (see col. 2, line 66 - col. 3, line 7). The combination of Arpaia and Hash does not specifically disclose having the features providing a mixer injection frequency derived from a voltage controlled oscillator frequency outside a bandwidth of received signal harmonics by dividing a voltage controlled oscillator output by a frequency divide ratio, a harmonic of the received signal corresponding to the divide ratio of the frequency divider. However, the examiner maintains that the

feature(s) providing a mixer injection frequency derived from a voltage controlled oscillator frequency outside a bandwidth of received signal harmonics by dividing a voltage controlled oscillator output by a frequency divide ratio, a harmonic of the received signal corresponding to the divide ratio of the frequency divider was well known in the art, as taught by Atkinson.

In the same field of endeavor, Atkinson discloses the features

providing a local oscillator signal (34) which reads on the claimed "mixer injection frequency" derived from a voltage controlled oscillator (VCO 38) outside received signal harmonics by dividing a controlled oscillator output by a frequency divide ratio (see col. 3, lines 19-44; Fig. 2), where a frequency (e.g., 1.35 GHz) is different than the received frequency (e.g., 1.8 GHz),

a harmonic of the received signal (e.g., F_3) corresponding to the divide ratio of the frequency divider (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the modified Arpaia, Hash, and Atkinson to have the feature providing a mixer injection frequency derived from a voltage controlled oscillator frequency outside a bandwidth of received signal harmonics by dividing a voltage controlled oscillator output by a frequency divide ratio, a harmonic of the received signal corresponding to the divide ratio of the frequency divider, in order to provide a direct conversion receiver or transmitter that has reduced leakage or interference between the radio

frequency input signal and the local oscillator, as taught by Atkinson (see col. 2, lines 42-46). The combination of the modified Arpaia, Hash, and Atkinson does not specifically disclose having the feature outside a bandwidth. However, the examiner maintains that the feature outside a bandwidth was well known in the art, as taught by Mouly.

In the same field of endeavor, Mouly discloses the feature outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g., GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the modified Arpaia, Hash, Atkinson, and Mouly to have the feature outside a bandwidth, in order that any coupling of the input RF signal to the VCO should have a minimal effect on the operation of the VCO, as taught by Atkinson (see col. 3, lines 50-52).

Allowable Subject Matter

7. Claims 1-10 allowed.

8. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons For Allowance

9. The following is a statement of reasons for the indication of allowable subject matter:

    a. Regarding **claims 1**, **5**, and **12**, the combination of the applied references fails to disclose or render obvious, the features of the claims.

Response to Arguments

10. Applicant's arguments filed 08 November 2007 have been fully considered but they are not persuasive.

The Examiner respectfully disagrees with applicant's arguments as the applied reference(s) provide more than adequate support and to further clarify (see the above claims for relevant citations and comments in this section).

11. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Regarding applicant's argument of claim 11 on pg. 12, 1st full par., "...mixer injection frequency outside a bandwidth of a fundamental frequency of the received signal...", the Examiner respectfully disagrees. Applicant has failed to appreciate the combined teachings of well-known prior art Atkinson and Mouly that clearly discloses the claimed feature(s) as would be clearly recognized by one of ordinary skill in the art. In particular, Atkinson discloses the feature(s) mixing the received signal at a mixer injection frequency, outside a fundamental frequency of the received signal (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system utilizes a RF input signal from a global system for mobile communication (GSM) operating at 1800 MHz and a VCO frequency at 1350 MHz and the output signal is not harmonic to the input signal. As further support in the same field of endeavor, Mouly discloses the feature(s) outside a bandwidth (e.g., 200 kHz) (see pgs. 214-218, section 4.2.2.1; Fig. 4.17), where the channel bandwidth for a system (e.g.,

GSM) operating at 1800 MHz is 200kHz and the modulated spectrum is somewhat wider. Therefore, the combination(s) of the reference(s) Atkinson and Mouly as addressed above more than adequately meets the claim limitations.

12. Regarding applicant's argument of claim 26 on pg. 16, 1st full par., "...does not meet...frequency divide ratio equals the harmonic number n...", the Examiner respectfully disagrees. Applicant has failed to appreciate the combined teachings of well-known prior art Atkinson, Mouly, and Atkinson '518 that clearly discloses the claimed feature(s) as would be clearly recognized by one of ordinary skill in the art. In particular, Atkinson discloses the feature(s) the frequency divide ratio q equals the harmonic number n (see col. 3, lines 34-52; col. 4, lines 37-65; Fig. 2), where the system output signal is not harmonic. As further support in the same field of endeavor, Atkinson '518 discloses the feature(s) feature the frequency divide ratio q equals the harmonic number n (see col. 3, lines 58-62; col. 6, lines 30-33; col. 5, lines 51-58), where the values of m and n can be selected to achieve the needed result in which equal to one would be inherent to provide the appropriate ratio. Therefore, the combination(s) of the reference(s) Atkinson, Mouly, and Atkinson '518 as addressed above more than adequately meets the claim limitations.

13. Regarding applicant's comment on pg. 17, 3rd par., "...demand...cite prior art...", the Examiner requests applicant to also see the following:

a. McNicol et al. (US 5,170,495) discloses a modulation distortion analyzer.

b. Louis et al. (US 6,845,233 B2) discloses a RF receivers with reduced spurious response for mobile stations and methods therefor.

14. Regarding applicant's argument(s) of claims 13-14, 16-18, 20-22, 24-25, and 27, the claims are addressed for the same reasons as set forth above and as applied above in each claim rejection.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Willie J. Daniel, Jr. whose telephone number is (571) 272-7907. The examiner can normally be reached on 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Appiah can be reached on (571) 272-7904. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WJD,JR/

WJD,JR
18 January 2008

CHARLES N. APPIAH
SUPERVISORY PATENT EXAMINER